CLAIMS

WHAT IS CLAIMED IS:

1.   A display system for displaying an interlaced image frame, said interlaced image frame comprising a top field and a bottom field, said top and bottom fields each having lines of pixels, said system comprising:

an image processing unit configured to process a stream of pixel data elements sequentially corresponding to said pixels in said top and bottom fields and generate a number of image sub-frames;

a modulator configured to generate a light beam bearing said number of image sub-frames; and

a wobbling device configured to displace said light beam such that each of said image sub-frames is spatially displayed offset from a previous image sub-frame;

wherein at least one of said image sub-frames is generated using only said pixel data elements in said top field and at least one of said image sub-frames is generated using only said pixel data elements in said bottom field.

2.   The system of claim 1, wherein said image processing unit is configured to process said pixel data elements in said top field to generate a first image sub-frame and said pixel data elements in said bottom field to generate a second image sub-frame.

3.   The system of claim 2, wherein:
said first image sub-frame is displayed in a first image sub-frame location; and
said second image sub-frame is displayed in a second image sub-frame location;
wherein said second image sub-frame location is spatially offset by an offset distance from said first image sub-frame location.

4.   The system of claim 3, wherein said offset distance comprises a vertical offset distance and a horizontal offset distance, said second image sub-frame location being vertically offset from said first image sub-frame location by said vertical offset distance and horizontally offset from said first image sub-frame location by said horizontal offset distance.

5.   The system of claim 2, wherein said image processing unit is further configured to:

process every other pixel data element in said top field starting with a first pixel data element in said top field to generate said first image sub-frame; and

process every other pixel data element in said bottom field starting with a second pixel data element in said bottom field to generate said second image sub-frame.

6.   The system of claim 2, wherein said image processing unit is further configured to:

average every two neighboring pixel data elements in each line of said top field starting with first and second pixel data elements in each line of said top field to generate said first image sub-frame; and

average every two neighboring pixel data elements in each line of said bottom field starting with second and third pixel data elements in each line of said bottom field to generate said second image sub-frame.

7.   The system of claim 6, wherein said image processing unit is configured to process a last pixel data element in each line of said bottom field in said generation of said second image sub-frame.

8.   The system of claim 2, wherein said image processing unit is further configured to:

generate said first image sub-frame by computing a function of one or more pixel data elements in said top field; and

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generate said second image sub-frame by computing a function of one or more pixel data elements in said bottom field.

9. The system of claim 8, wherein said function is a linear function.

10. The system of claim 1, wherein said image processing unit is configured to:

process said pixel data elements in said top field to generate a first image sub-frame and a second image sub-frame; and

process said pixel data elements in said bottom field to generate a third image sub-frame and a fourth image sub-frame.

11. The system of claim 10, wherein:

said first image sub-frame is displayed in a first image sub-frame location;

said second image sub-frame is displayed in a second image sub-frame location;

said third image sub-frame is displayed in a third image sub-frame location; and

said fourth image sub-frame is displayed in a fourth image sub-frame location.

12. The system of claim 10, wherein said image processing unit is further configured to:

process every other pixel data element in said top field starting with a first pixel data element in said top field to generate said first image sub-frame;

process every other pixel data element in said top field starting with a second pixel data element in said top field to generate said second image sub-frame;

process every other pixel data element in said bottom field starting with a first pixel data element in said bottom field to generate said third image sub-frame;

process every other pixel data element in said bottom field starting with a second pixel data element in said bottom field to generate said fourth image sub-frame.

13.   The system of claim 10, wherein said image processing unit is further configured to:

average every two neighboring pixel data elements in each line of said top field starting with first and second pixel data elements in each line of said top field to generate said first image sub-frame;

average every two neighboring pixel data elements in each line of said top field starting with second and third pixel data elements in each line of said top field to generate said second image sub-frame;

average every two neighboring pixel data elements in each line of said bottom field starting with first and second pixel data elements in each line of said bottom field to generate said third image sub-frame; and

average every two neighboring pixel data elements in each line of said bottom field starting with second and third pixel data elements in each line of said bottom field to generate said fourth image sub-frame.

14.   The system of claim 13, wherein said image processing unit is further configured to process a last pixel data element in each line of said top field in said generation of said second image sub-frame and a last pixel data element in each line of said bottom field in said generation of said fourth image sub-frame.

15.   The system of claim 10, wherein said image processing unit is further configured to:

generate said first image sub-frame by computing a function of one or more pixel data elements in said top field;

generate said second image sub-frame by computing a function of one or more pixel data elements in said top field;

generate said third image sub-frame by computing a function of one or more pixel data elements in said bottom field; and

generate said fourth image sub-frame by computing a function of one or more pixel data elements in said bottom field.

16.   The system of claim 15, wherein said function is a linear function.

17.   The system of claim 1, further comprising display optics configured to display said light beam on a viewing surface.

18.   A method of displaying an interlaced image frame, said interlaced image frame comprising a top field and a bottom field, said top and bottom fields each having lines of pixels, said method comprising:

processing a stream of pixel data elements sequentially corresponding to said pixels in said top and bottom fields and generating a number of image sub-frames corresponding to said top and bottom fields; and

displaying each of said image sub-frames offset from a previous image sub-frame.

19.   The method of claim 18, wherein said step of processing said stream of pixel data elements comprises processing said pixel data elements in said top field to generate at least one of said image sub-frames and processing said pixel data elements in said bottom field to generate at least one of said image sub-frames.

20.   The method of claim 19, wherein said step of processing said stream of pixel data elements further comprises processing pixel data elements in said top field to generate a first image sub-frame and said pixel data elements in said bottom field to generate a second image sub-frame.

21.   The method of claim 20, wherein said step of displaying said image sub-frame comprises:

displaying said first image sub-frame in a first image sub-frame location; and

displaying said second image sub-frame in a second image sub-frame location;

wherein said second image sub-frame location is spatially offset by an offset distance from said first image sub-frame location.

22. The method of claim 21, wherein said offset distance comprises a vertical offset distance and a horizontal offset distance, said second image sub-frame location being vertically offset from said first image sub-frame location by said vertical offset distance and horizontally offset from said first image sub-frame location by said horizontal offset distance.

23. The method of claim 20, wherein said step of processing said stream of pixel data elements further comprises:

processing every other pixel data element in said top field starting with a first pixel data element in said top field to generate said first image sub-frame; and

processing every other pixel data element in said bottom field starting with a second pixel data element in said bottom field to generate said second image sub-frame.

24. The method of claim 20, wherein said step of processing said stream of pixel data elements further comprises:

averaging every two neighboring pixel data elements in each line of said top field starting with first and second pixel data elements each line of in said top field to generate said first image sub-frame; and

averaging every two neighboring pixel data elements in each line of said bottom field starting with second and third pixel data elements in each line of said bottom field to generate said second image sub-frame.

25. The method of claim 24, wherein said step of processing said stream of pixel data elements further comprises processing a last pixel data element in each line of said bottom field in said generation of said second image sub-frame.

26. The method of claim 20, wherein said step of processing said stream of pixel data elements further comprises:

computing a function of one or more pixel data elements in said top field to generate said first image sub-frame; and

computing a function of one or more pixel data elements in said bottom field to generate said second image sub-frame.

27. The method of claim 26, wherein said function is a linear function.

28. The method of claim 19, wherein said step of processing said stream of pixel data elements further comprises:

processing said pixel data elements in said top field to generate said first and second image sub-frames; and

processing said pixel data elements in said bottom field to generate said third and fourth image sub-frames.

29. The method of claim 28, wherein said step of displaying said image sub-frame comprises:

displaying said first image sub-frame in a first image sub-frame location;

displaying said second image sub-frame in a second image sub-frame location;

displaying said third image sub-frame in a third image sub-frame location; and

displaying said fourth image sub-frame in a fourth image sub-frame location.

30.   The method of claim 28, wherein said step of processing said stream of pixel data elements further comprises:

processing every other pixel data element in said top field starting with a first pixel data element in said top field to generate said first image sub-frame;

processing every other pixel data element in said top field starting with a second pixel data element in said top field to generate said second image sub-frame;

processing every other pixel data element in said bottom field starting with a first pixel data element in said bottom field to generate said third image sub-frame;

processing every other pixel data element in said bottom field starting with a second pixel data element in said bottom field to generate said fourth image sub-frame.

31.   The method of claim 28, wherein said step of processing said stream of pixel data elements further comprises:

averaging every two neighboring pixel data elements in each line of said top field starting with first and second pixel data elements in each line of said top field resulting in a first group of averaged pixel data to generate said first image sub-frame;

averaging every two neighboring pixel data elements in each line of said top field starting with second and third pixel data elements in each line of said top field to generate said second image sub-frame;

averaging every two neighboring pixel data elements in each line of said bottom field starting with first and second pixel data elements in each line of said bottom field to generate said third image sub-frame; and

averaging every two neighboring pixel data elements in each line of said bottom field starting with second and third pixel data elements in each line of said bottom field to generate said fourth image sub-frame.

32.   The method of claim 31, wherein said step of processing said stream of pixel data elements further comprises:

processing a last pixel data element in each line of said top field in said generation of said second image sub-frame; and

processing a last pixel data element in each line of said bottom field in said bottom field in said generation of said fourth image sub-frame.

33. The method of claim 28, wherein said step of processing said stream of pixel data elements further comprises:

computing a function of one or more pixel data elements in said top field to generate said first image sub-frame;

computing a function of one or more pixel data elements in said top field to generate said second image sub-frame.

computing a function of one or more pixel data elements in said bottom field to generate said third image sub-frame; and

computing a function of one or more pixel data elements in said bottom field to generate said fourth image sub-frame.

34. The method of claim 33, wherein said function is a linear function.

35. The method of claim 18, further comprising:

generating a light beam bearing said image sub-frames; and

displacing said light beam to display said image sub-frames.

36. A system for displaying an interlaced image frame, said interlaced image frame comprising a top field and a bottom field, said top and bottom fields each having lines of pixels, said system comprising:

means for processing a stream of pixel data elements sequentially corresponding to said pixels in said top and bottom fields and generating a number of image sub-frames corresponding to said top and bottom fields; and

means for displaying each of said image sub-frames offset from a previous image sub-frame.

37.   The system of claim 36, wherein said means for processing comprises means for processing said pixel data elements in said top field to generate at least one of said image sub-frames and processing said pixel data elements in said bottom field to generate at least one of said image sub-frames.

38.   The system of claim 37, wherein means for processing said stream of pixel data elements further comprises processing pixel data elements in said top field to generate a first image sub-frame and said pixel data elements in said bottom field to generate a second image sub-frame.

39.   The system of claim 38, wherein said means for processing further comprises:
       means for processing every other pixel data element in said top field starting with a first pixel data element in said top field to generate said first image sub-frame; and
       means for processing every other pixel data element in said bottom field starting with a second pixel data element in said bottom field to generate said second image sub-frame.

40.   The system of claim 38, wherein said means for processing further comprises:
       means for averaging every two neighboring pixel data elements in each line of said top field starting with first and second pixel data elements in each line of said top field to generate said first image sub-frame; and
       means for averaging every two neighboring pixel data elements in each line of said bottom field starting with second and third pixel data elements in each line of said bottom field to generate said second image sub-frame.

41.   The system of claim 40, wherein said means for processing further comprises means for processing a last pixel data element in each line of said bottom field in said generation of said second image sub-frame.

42.   The system of claim 38, wherein said means for processing further comprises:

means for computing a function of one or more pixel data elements in said top field to generate said first image sub-frame; and

means for computing a function of one or more pixel data elements in said bottom field to generate said second image sub-frame.

43.   The system of claim 42, wherein said function is a linear function.

44.   The system of claim 37, wherein number of image sub-frames comprises a first image sub-frame, a second image sub-frame, a third image sub-frame, and a fourth image sub-frame, wherein said processing means further comprises:

means for processing said top field to generate said first and second image sub-frames; and

means for processing said bottom field to generate said third and fourth image sub-frames.

45.   The system of claim 44, wherein said means for displaying said image sub-frames comprises:

means for displaying said first image sub-frame in a first image sub-frame location;

means for displaying said second image sub-frame in a second image sub-frame location;

means for displaying said third image sub-frame in a third image sub-frame location; and

means for displaying said fourth image sub-frame in a fourth image sub-frame location.

46.   The system of claim 44, wherein said processing means further comprises:

means for processing every other pixel data element in said top field starting with a first pixel data element in said top field to generate said first image sub-frame;

means for processing every other pixel data element in said top field starting with a second pixel data element in said top field to generate said second image sub-frame;

means for processing every other pixel data element in said bottom field starting with a first pixel data element in said bottom field to generate said third image sub-frame;

means for processing every other pixel data element in said bottom field starting with a second pixel data element in said bottom field to generate said fourth image sub-frame.

47. The system of claim 44, wherein said processing means further comprises:

means for averaging every two neighboring pixel data elements in said top field starting with first and second pixel data elements in said top field to generate said first image sub-frame;

means for averaging every two neighboring pixel data elements in said top field starting with second and third pixel data elements in said top field to generate said second image sub-frame;

means for averaging every two neighboring pixel data elements in said bottom field starting with first and second pixel data elements in said bottom field to generate said third image sub-frame; and

means for averaging every two neighboring pixel data elements in said bottom field starting with second and third pixel data elements in said bottom field to generate said fourth image sub-frame.

48. The system of claim 47, wherein said processing means further comprises:

means for processing a last pixel data element in said top field in said generation of said second image sub-frame; and

means for processing a last pixel data element in said bottom field in said bottom field in said generation of said fourth image sub-frame.

49. The system of claim 44, wherein said processing means further comprises:

means for computing a function of one or more pixel data elements in said top field to generate said first image sub-frame;

means for computing a function of one or more pixel data elements in said top field to generate said second image sub-frame.

means for computing a function of one or more pixel data elements in said bottom field to generate said third image sub-frame; and

means for computing a function of one or more pixel data elements in said bottom field to generate said fourth image sub-frame.

50. The system of claim 49, wherein said function is a linear function.